

Article

Risk Management and Learning Climate in Emergency Contexts: A Qualitative Study

Teresa Galanti 

Department of Psychological, Health and Territory Sciences, “G. d’Annunzio” University of Chieti-Pescara, 66100 Chieti, Italy; teresa.galanti@unich.it

Abstract: Background: Several researchers have questioned the strategies necessary for effective risk management as well as of human error and its consequences, looking at both positive and negative consequences. Starting from this perspective, this study intended to investigate risk management in the emergency context due to the COVID-19 pandemic. Methods: A total of five in-depth interviews were conducted with senior managers of multinationals, asking them to talk about the management of their human capital and the policies of error and safety management adopted in their organizations before, during, and after the pandemic. Results: Qualitative interviews analysis revealed three interesting clusters related to crisis, trust, and risk management; quantitative results, instead, confirmed the existent link between crisis and error management and the strategic role of organizational management in the diffusion of a climate in which is possible to learn from both success and failure. Conclusion: In summary, preliminary results seemed to confirm what emerged from the most recent literature, which is the urgency for organizations to create a culture of intelligent risk-taking that leads to learning and improved knowledge and that includes the participation of all workers. Moreover, this study also underlines the possibility of extending the advantages of Error Management Training in emergency context.



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1. Introduction

In the field of Human Resources, several studies have investigated human error and its consequences. Errors in organizations consist of unintended and potentially avoidable deviations from organizational goals and standards that can produce either adverse or positive consequences [1,2]. Reason et al. [3] consider errors conceptually inseparable from intentions; to understand the former, it is necessary to clarify the level of intentionality of the acts. Therefore, it is important to distinguish between unintentional and unplanned acts, and intentional and premeditated acts. The first group is in turn divided in two categories: inattention, when the initial intention is correct, but the action is not completed correctly; and lapses, which are a memorization error. In the second group of errors there are mistakes and violations; mistakes are errors due to an incorrect intention that produces an incorrect action, while violations are errors caused by a conduct inconsistent with instructions, standards, and rules. In other words, violation involves a deliberate intention to break a rule or to not conforming to a standard [3]; furthermore, error may not even be a failure, because a failure is an outcome that might be caused by a combination of errors, although not all errors lead to failure. Lastly, it is important to distinguish errors from risks: when we talk about risk, we refer to a negative and harmful possibility that resides in the environment, not to acts committed by humans.

It is evident that lapses, inattention, and mistakes cannot be expected and avoided, due to limitations of the human cognitive system; however, it is possible and necessary to implement countermeasures to reduce potential impacts of these errors, creating a sort of

barrier between unsafe behavior and its consequences to prevent incidents, injuries, and disaster due to human unreliability.

The present paper intended to test the validity of Error Management Training (EMT), based on learning from error, in an emergency context due to the COVID-19 pandemic which is having a relevant impact on the experience of work, underlining how urgent and mandatory it is to promote workers' proactive role in error management and safety promotion at work.

Based on the literature review summarized below, it is expected that the emerging contents could refer to error management and safety at work. Moreover, it is expected that the results of this study can provide a major contribution, for example, referring to the possibility of using EMT in an emergency context and also in a typical form of work such as telecommuting or working from home.

2. Background

In the literature, there are several lines of error research that investigate different dimension of error, but they have progressed in isolation from each other. According to Lei, Naveh and Novikov [4], it is useful to differentiate three fundamental dimensions investigated by researchers: level of analysis, temporal dynamism, and priority. The first dimension is related to error attributed to individuals (e.g., an employee) or collective actors (e.g., a team or a system). Temporal dynamism consists of the organizational response time to error. Finally, the priority dimension is related to the tension between prioritizing error management and other conflicting demand simultaneously.

2.1. Classification of Errors in Organization

Errors in organization can be classified in individual and collective errors. The first ones consist in those errors caused by the individual's actions alone without any other participation [5]. Collective errors, instead, are related to the actions of multiple persons within organizations (team, unit, department) or between such entities [6]. In fact, it is important to distinguish group or team errors from organization or system errors, because the former occur in collaborative and interdependent work, while the latter occur when "multiple elements converge in unpredicted or unprecedented ways" [7] (pp.187–188). Several studies have focused on the role of error training in reducing individual errors and improving individual learning. There is error training that aims for error-free performance, called Error Avoidance Training (EAT), viewing errors as negative events that should be avoided at all costs, and error training that encourage error management, called Error Management Training (EMT), considering errors as effective learning opportunities. A large amount of evidence emphasizes that EMT is more effective than EAT in helping trainees to deal with errors, and learn from them [8,9], especially in situations where it is necessary to develop new solutions and to deal with frequent error occurrence.

To fully understand the weight of social–organizational contexts in safety management, the concept of a safety climate was introduced [10]. This is a multilevel and multidimensional construct consisting of "a set of knowledge [of workers] with respect to safety aspects within the organization" [10] (pp.96–102). Therefore, it is a specific form of organizational climate based on the subjective evaluation of the safety experience in the workplace [11] that constitutes a sort of guide to organizational behavior (protection measure adoption, violation of rules, respect of rules, use of specific equipment). As a multidimensional construct, several factors could be included, such as perceptions of formal practices (training) as well as informal processes (group relations) [12]. At team level, some studies underline the relationship between a team climate and team error rates [13,14]; Edmondson and Lei [15] found a positive association between psychological safety and the rate of error reported at the unit level, while Hoffman and colleagues [16] have investigated the safety climate as an important antecedent of team error and accident rates, considering safety climate aspects such as adherence to safety protocols, open communication, and constructive responses to errors.

At system level, researchers focused on the construct of organizational culture, specifically error management culture [17,18]. According to them, error management culture (EMC) is a set of normal and common practices that encourage error detection, communication, analysis, and correction, able to reduce negative error consequences and to promote positive error consequences, such as learning and innovation. Regarding the possibility of using error as a chance to learn, some studies have suggested that, in order to learn from errors at the organizational level, it is essential to create an organizational environment of psychological safety that supports this process [15]. According to Perrow [19], system errors depend on interdependent actions and elements that are impossible to be planned or anticipated. However, recent research suggests the opposite, stating that system errors can be avoided through individual and collective surveillance [20], by expanding people's knowledge, technical ability, and social and relational networks to be able to compensate for any losses. Nonetheless, both points of view underline the importance of adopting a holistic approach to error that integrates technical and social system theory [4].

2.2. Error Learning Climate

Learning climates can influence what happens within the work context and influence organizational members' experiences. Therefore, it is important to clearly understand this construct, to impact on performance, motivation, and employees' behaviors [21,22]. In particular, the interaction between learning climate and motivation plays a strategic role on the organizational eco-system and on the learning process. Continuous learning and training are considered essential strategies for development, innovation, and competitiveness in organizations [23]. Moreover, in terms of sustainability, Goal 4 of the 17 Sustainable Development Goals (SDGs) adopted by all United Nations Member States recommends promoting training and self-improvement courses as well as continuing education for employees [24]. As Fonseca et al. clearly emphasize [25], the SDGs aim to inspire the operationalization and integration of sustainability into organizations worldwide, contributing to sustainable development for society. In this perspective, the learning climate seem to be not a possibility, but rather a moral obligation to guarantee sustainable development.

Several studies on training have investigated methods, contents, and situations that encourage learning and the modification of behavior, to improve employees' performance and organizational results. The motivation for training is, among the individual characteristics favorable to learning, the one that has received the most attention, as reported in the meta-analysis by Colquitt, LePine and Noe [26]. In their study, Tannenbaum and Yukl [27] argue that the effectiveness of training is not produced only by the quality of the design and the analysis of training needs, but also by people's abilities and motivation to learn. Motivation for training thus becomes important in the acquisition of knowledge, skills, and their use in order to improve professional performance and activities [27]. Further studies have shown that people who are more motivated to learn are better able to assimilate and absorb, transferring new acquisitions to work [23,28,29]. However, learning is not an individual activity, linked to performance itself, but an activity based on organizational behaviors that constitute the individual/organization relationship and are suitable for determining the motivation to learn, increasing and developing necessary work and organizational skills [30].

Returning to the concept of the learning climate [31], it is defined as a set of shared perceptions regarding policies, experience–employee procedures and behaviors that are rewarded or that are facilitated and/or expected by an organization. In other words, it is the way in which workers perceive the actions that employers take to support and facilitate learning in the workplace. Past research has shown how the learning climate is able to prevent negative outcomes for workers, such as stress and turnover, on the one hand, and constitutes an important predictor of valuable skills and attitudes for the organization, such as the capacity for innovation or job satisfaction [32], on the other. It is a short-term instrumental variable capable of guaranteeing the objectives that the training intends to achieve and is made up of work-oriented factors that can influence the success or failure of

learning and its effectiveness. The literature on learning in organizations agrees, considering the learning climate as consisting of three different dimensions: facilitation, which is the organizational support to learning [31,33]; appreciation, or the set of HRM policies to promote reward learning [34,35]; and error avoidance, to allow a condition for learning by doing so in a general policy of error tolerance [17,33]. As Argyris and Schön [36] showed, only when organizational members transformed learning into common heritage for the organization, encoding it in rules, norms, and values, is it possible for real organizational learning. It is not only a simple summation of individual learnings, but rather the ability to transform group cognitive ability thanks to each individual contribution.

2.3. Organizational Crisis Management

The term crisis management refers to the applied research sector that deals with the study and implementation of risk management strategies. Extremely extensive is the literature concerning different risk management methodologies in the panorama of emergency psychology. If it is true that research on crisis management following natural disasters or human-made events appears to be extremely flourishing, the field of investigating organizational crisis management appears to be considerably less explored; where by crisis, we mean an event or series of events that, if devoid of accurate management, can negatively affect the set of assumptions and basic beliefs of the system. The situations labelled under the name “critical” are therefore not only extremely rare situations (earthquake, nuclear disaster), but also those situations that, although common, are able to generate a sense of urgency, leading to a clear separation between a before stage, defined as pre-crisis and an after stage, defined as post-crisis. Several researchers have questioned the strategies necessary for effective management of a critical event. Farazmand [37] identified four key actions in a crisis management process: mitigation, consisting of the reduction in and/or containment of risks; preparation, understood as the ability to prepare an action plan to limit the consequences; response, where assistance and support can be provided; and finally, recovery, or the ability to return to a normal situation. A study by Stern and Sundelius [38] showed that the ability to analyze one’s experiences and use the results as a driver of change represents an added value in facing future crises. A crisis management process will then be truly successful to the extent that it uses the crisis experience as an opportunity to learn from experience, to change one’s behavior and attitudes in order to promote more effective action practices.

3. Aim of the Study

Starting from this perspective, and in line with the proposal by Van Dick and colleagues [17], this study intended to investigate organizational error management in the emergency context due to the COVID-19 pandemic. The key idea is to underline the extent to which it is possible to look at a crisis as an opportunity for learning and self-evaluation, as well as a possibility for innovation and organizational progress. The organizational literature about this theme underlined that a major challenge of organizational learning and organizational change in general is to overcome the negative effects of punishments in order to create an environment in which people can learn. This is particularly true during periods of frame-breaking change, when the correct approach to possible failure is necessary not only in building successful careers, but also in sustaining the creative process. As argued by McGill and Slocum [39], learning cultures are characterized by: (1) clear and consistent communication; (2) openness to experience; (3) encouragement of responsible risk-taking; and (4) willingness to acknowledge failure and learn from it.

Specifically, this study examines the perception of workplace errors and the possibility to learn from errors, starting from managers’ points of view, to understand how organizations and leaders can best manage the learning climate in a rapidly changing world that requires employees to be adaptable, agile, and flexible to sustain individual performance and support a learning environment [40].

According to Zhao [41], learning is a process of reflection and analysis of errors, as well as the ability to subsequently apply new knowledge to future actions. In other words, this is a social exchange process in which errors are discussed [42] and shared with other employees who need a climate characterized by a willingness to both report and discuss errors and a culture in which it is psychologically safe to speak up about errors [43]. Recent studies emphasize that leaders' behaviors have a significant influence on employees' error learning [44,45].

In summary, we conducted an exploratory study to underline the managers' point of view on the possibility of using learning by errors as an opportunity to encourage development and innovation processes, as well as to overcome crises and emergency situations.

4. Materials and Methods

This exploratory study adopted a mixed methodology: data were collected through a qualitative methodology and subsequently analyzed through both qualitative and quantitative methods. A total of 5 in-depth interviews were conducted with senior managers of multinational companies, asking them to talk about the management of their human capital and the policies of error and safety management adopted in their organization. The in-depth interview is a technique designed to elicit a vivid picture of the participant's perspective on the research topic. During in-depth interviews, the respondent is considered the expert and the interviewer is considered the student. The researcher's interviewing techniques were motivated by the desire to learn everything the participant could share about the research topic, even without any hypotheses to be verified. Regarding the analysis of the interviews' content, a theoretical premise seemed to be necessary, which is one of narrative analysis applied to organizational contexts [46], according to which organizations live by discourses; researchers should be ready to disentangle the network of collective narrations and discourses which is shaped through and by the shared practices of accounting [47]. Therefore, the aim of the interviews was to investigate the different methods of risk management in national and international organizational realities. The structure of the conversation guide was around three major themes: (1) the strategic role of HR management in current organizations; (2) the risks associated with constant changes required by technological progress; and (3) the impact of changes in classical forms of work on error and risk management. Interviews were audio-taped and transcribed. These have been analyzed using different techniques, such as discourse analysis and content analysis, and run through the T-Lab software (analysis of word occurrence and co-word mapping, analysis of Markovian sequences). For qualitative analysis, we carried out a classic analysis of discourse [48], consisting mainly of an analysis of metaphors and linguistic agency.

5. Results

5.1. Qualitative Results

The interviews were analyzed by triangulating two qualitative techniques: content analysis and discourse analysis [48]. Discourse analysis is a qualitative, interpretative, and constructionist methodology that allows researchers to explore how participants actively construct categories, or clusters, regarding the themes investigated. It considers metaphors and linguistic agency: metaphors are considered as a tool of thought, conceptualization that can broaden the vision of the research object creating connections with other themes; linguistic agency refers to the use of lexical and morphological aspects of the linguistic system to result or not result oneself as the agent responsible.

In this perspective, the content of interviews realized was faithfully transcribed and all linguistic metaphors used to talk about the topic were identified, interpreted and explained. The idea was to generalize from them the conceptual metaphors they exemplified, and to use the results to suggest understandings or thought patterns which construct or constrain people's beliefs and actions.

From the interviews' analysis, the three more interesting clusters appeared to be: (1) crisis, (2) trust, and (3) risk management and perception. One of the most interesting

clusters which emerged referred to the crisis as “a lioness whose jaws could devour you, if you do not face it with shared responsibility in which everyone individually plays their part”. Regarding this, G.R said: “You can only get out of the jaws of the crisis by opening up to the other . . .

Everyone has to roll up their sleeves, from the smallest to the largest. We must stop thinking that there is no personal responsibility”. The crisis was described as an opportunity to look “with a healthy realism” at the mistakes made, not with the intention of researching and punishing the guilty, but with the awareness that the greatest value of an organization lies in human capital. As A.O. said, “you have to get the best out of people through shapes other than the usual ones”, referring to sudden changes required by the current emergency situation. The need for change emerged as constant, bringing benefit to the company but while paying attention to the person and their needs. Therefore, the value of an organization that encourages new learning and the acquisition of an ever greater “sense of responsibility” also emerged. “Thanks to the crisis we discover the mistakes we were making, many of them just mine. To be honest, the crisis corrected us and saved us! This is a crisis linked to a wrong mindset and a way of working . . . in my company there were errors that were causing damage. This served me a lot, I took a bath of humility and got my feet back on the ground. It’s like I had to learn again. And that’s where the sense of responsibility comes in”.

A second important cluster which emerged from the interviews referred to trust, both of the employee and superiors or managers, and its role in every transformational process in the organizations. A.O said: “The head of department didn’t trust them”, “if I don’t see my people, I don’t control them, I don’t trust what they do inside the office”. To realize a real change, a mutual trust between the worker and the organization is necessary. If we think about the new forms of work, such as smart-working or other agile types of work that an organization can offer to workers, trust becomes the key to success. These are, in fact, working methods not based on visual control and physical presence, but rather on a result-oriented control, on the definition of objectives and steps to achieve them that require an intense proactive effort and the diffusion of a new management culture and a transformational leadership style.

Finally, the issue of risk emerged from the interviews in a twofold sense: the first, more technical, referring to the security of IT data and the need to provide workers with suitable tools and procedures for the management of company data; A.O said: “There is an informatic safety for which both the organization and the employee must ensure that their data is not stolen and that they do not run any IT risks”. The second reference to safety, more far-reaching, referred to the psycho-social risks inherent in agile work; M.A. asserted that “Risks is always present (in agile work) because it is easy to be distracted . . . there may be less productivity (working) from home without being observed, you could get lost in other activities and not respect schedules”, and also “It is also important to maintain a physical relationship with colleagues”, referring to the risk of isolation of these agile forms of work [49,50]. If it is true, as the name itself claims, that smart working was born with the aim of improving people’s quality of life, the risks of its mismanagement seem to be considerable, which are organizational risks (distraction, isolation, disengagement) as well as individual risks (work–life balance, satisfaction, well-being) [51].

5.2. Quantitative Results

The content of interviews was also analyzed with a quantitative methodology using the statistical software T-Lab, able to return a mapping of the contents characterizing the interview. Before deeply exploring details of the analysis, it is important to remark that we prepared our text for analysis through lemmatization, which reorganizes the T-LAB database, creating different tables used to analyze data; in particular, the idea is that words are clustered together that have the same root meaning, such as, “family” and “familial”. Such an operation was performed only for the words (lemmas or categories) considered interesting for the subsequent analyses, such as “work”, “learning”, “error”, etc. We have

carried out an automatic analysis of the content, which started from the idea that the more specific language to which families are referred (analysis of word occurrences), the more active these concepts are in the respondent's mind. In other words, when people often refer to the same concepts, it is because they are important for them.

Analysis of Occurrence and Co-Occurrence

The first thing T-Lab enables with textual material is to analyze word occurrences and cooccurrences. The output of the software shows the most cited word in the middle, and all around are the words that co-occur the most with it, according to an association index: the Cosine coefficient; in graphical terms, the more two words co-occur, the more they are closed in the dimensional space [52]. It is always possible to “dialog” with the software, asking it to put a specific word of interest in the middle for the user to have a graphical representation of its associations; in such a sense, T-Lab can assist the user following both an automatic analysis path and a customized one.

Concerning our study, it is remarkable that “crisis” and “error” were the most cited words. By clicking on the words associated with the central term, it is possible to obtain the phrase where the two words co-occur; this cue is particularly useful in terms of mixed methods, because with just a click the original textual material is obtained which can be analyzed by discourse analysis. We checked occurrences and co-occurrences, setting a frequency threshold of four. As Figure 1 shows, the value association of the thematic elements is graphically represented in terms of distance from the keyword in the center.

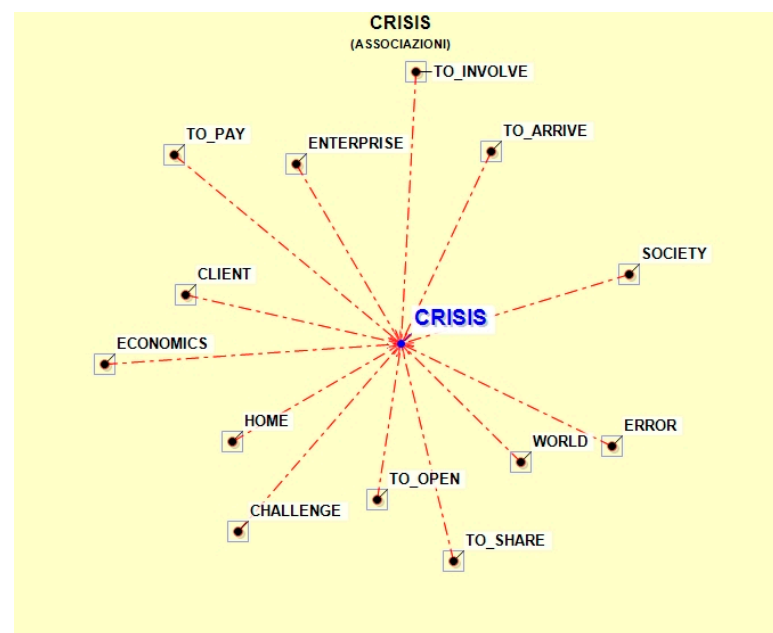


Figure 1. Co-occurrence with the lemma “crisis”.

The first most cited word was crisis, and it appeared strongly associated (see Table 1) with the word “error” (association index, Cosin, 0.29), clearly underlining the existent link between these two words, especially in an organizational context. By organizational crisis, we mean a series of events, or of errors, that can negative influence the organizational system and that requires efficacy management.

Table 1. Coefficient of Cosin and χ^2 of co-occurrence with the lemma CRISIS.

LEMMA	COEFF	C.E. (A)	C.E. (AB)	CHI ²
Error	0.294	4	3	6.414
to pay	0.277	2	2	6.89
to share	0.277	2	2	6.89
challenge	0.277	2	2	6.89
to involve	0.226	3	2	3.367
awareness	0.226	3	2	3.367
reality	0.222	7	3	1.703
to generate	0.196	1	1	3.415

Secondly, the association with the words “to pay” (Cosin, 0.28) and *challenge* (Cosin, 0.28) seems to validate the hypothesis that a change of thinking is necessary, to be able to see an error not only as a something with an inevitable price to pay, but also as a challenge to organizational improvement and growth. According to this, even the word “generate” underlines the creative nature of crisis, which can promote positive changes if properly managed.

The associations with the words “involve” (Cosin, 0.23) and “awareness”(Cosin, 0.23) are also interesting, which underline the need to create a culture of intelligent risk-taking that involves the organization at every level.

Finally, anchoring to the real situation seemed to clearly emerge from interviewees’ use of the word “reality” (Cosin, 0.22), confirming that crises do not happen in an organizational vacuum, but from concrete and repeated errors. Table 1 reports the coefficient of Cosin and χ^2 of co-occurrence with the lemma *Crisis*.

The word “error” (Figure 2) appeared even more strongly associated with the lemma “generate” (Cosin, 0.5) than the word crisis, in reference to the possibility to consider not only the negative nature of error, but also the positive potential in terms of learning possibility and improving performance (see Table 2).

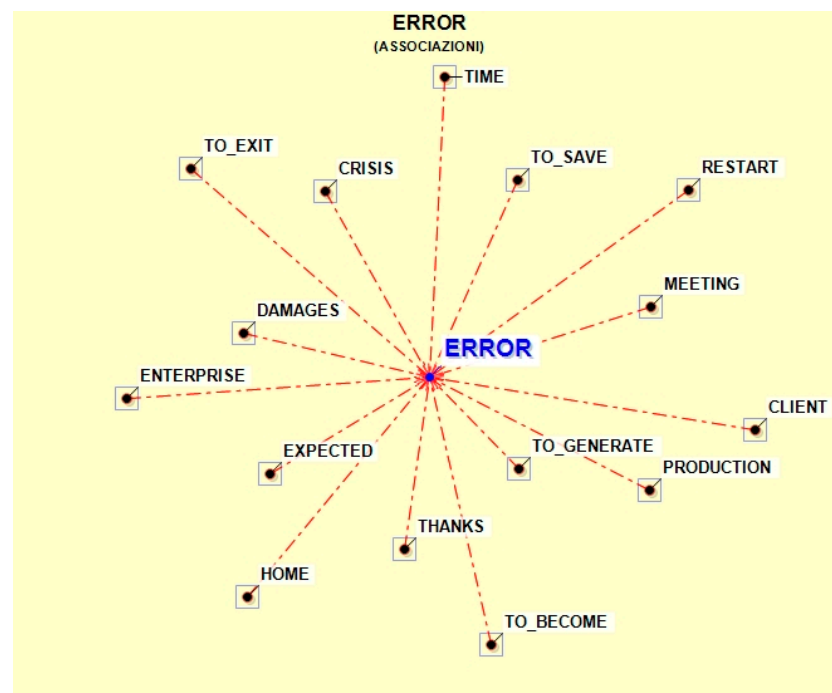
**Figure 2.** Co-occurrence with the lemma error).

Table 2. Coefficient of Cosin and Chi² of co-occurrence with lemma “ERRORE” (ERROR).

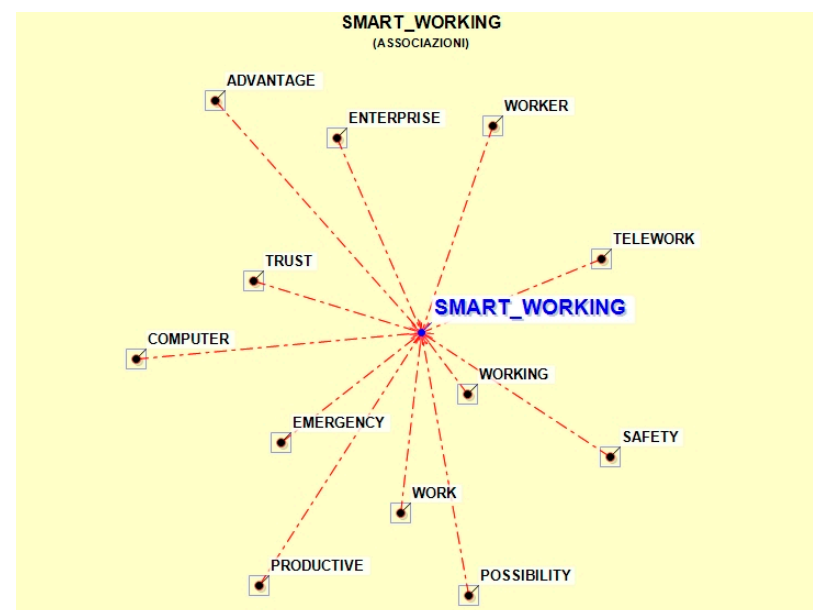
LEMMA	COEFF	C.E. (A)	C.E. (AB)	CHI ²
to generate	0.5	1	1	27.743
expected	0.354	2	1	12.996
thanks	0.354	2	1	12.996
to save	0.354	2	1	12.996
crisis	0.294	26	3	6.414
production	0.267	14	2	5.971
re-start	0.204	6	1	3.239
innovation	0.204	11	1	1.267

In addition, the word error was also associated with the word production, emphasizing the negative consequences of inaccurate error management on individual performance and on production.

Again, the reference to the need to consider error as an element capable of generating change, as an opportunity for learning appeared with the words “restart” (Cosin 0.20) and improve.

Finally, the word “innovation” seemed to confirm the opportunities inherent in learning from mistakes that can be an important catalyst in organizational innovation.

Then, a personalized analysis was conducted, asking the software to map the co-occurrences with the stimulus word “smart-working” (Figure 3). This choice is explained by the research interest to investigate how this new typology of flexible work could be an example of effective crisis management in an emergency context.

**Figure 3.** Co-occurrence with the lemma “smart working”.

In fact, before the COVID-19 outbreak, adopting this flexible way of working was usually a planned choice, requiring a period of design, preparation, and adaptation so that both organizations and employees could benefit from it.

However, the spread of the pandemic has been and still is a global emergency that has prompted companies to adopt remote working, especially from home, as one of the most effective strategies to ensure the continuity of services and production while keeping employees safe [51].

Firstly, it is interesting to note the association (see Table 3) with the lemma “possibility” (Cosin, 0.32), because it underlines the role of smart working, considering it as not an end, but as the means and tools supporting an end. Secondly, there was association with the

lemma “trust” (Cosin, 0.30), a key construct in terms of psychological contract. It seems, as already emerged from the qualitative analysis of metaphors, that the interviewees considered smart working as a real opportunity to both individual and organizational growth, but only if there was a frame of mutual trust and shared values.

Table 3. Coefficient of Cosin and χ^2 of co-occurrence with the lemma “SMART WORKING”.

LEMMA	COEFF	C.E. (A)	C.E. (AB)	CHI ²
Possibility	0.328	8	5	6.766
Trust	0.303	6	4	6.133
Safety	0.303	6	4	6.133
Productive	0.249	5	3	3.595
Advantage	0.249	5	3	3.595
Result	0.214	12	4	0.582

Clear examples of this are statements such as: “smart_working, today, I carry it forward with that people with whom I feel able to speak in term of trust” or “People, through smart_working, realize that there is attention to them and, thanks the mechanism of trust, they don’t fail their commitments”.

Furthermore, another interesting association was with the word “Safety” (Cosin, 0.30), which was understood by the respondents as informational safety or, in other words, data security. We expected a reference to safety understood as worker safety, (i.e., in the context of the emergency due to COVID-19, the need to work from home in order to ensure workers’ safety and health). However, all the interviewees seemed to believe that it is crucial to protect IT security when it comes to smart-working.

Finally, the link with productivity emerged, through words such as “productive” (Cosin, 0.24) and “results” (Cosin, 0.21), underlining the potential of smart working on a productive point of view.

6. Discussion

According to the most recent literature [53,54], it seems that strategic crisis management is only possible under the condition that all organizational components are involved and feel personally responsible themselves. In fact, organizations can learn from both success and failure, but to really learn from failure it is necessary that every member must feel allowed to make mistakes, aware that mistakes are acceptable and can induce learning [55,56].

Following Zhao [41], in the current research, error learning was defined as the process in which employees reflect on errors that they have made and use this knowledge to modify or improve their behavior. The basic assumption is that organizations are characterized by interdependent work environments where errors and risk management are a shared priority.

Furthermore, the results of this study seem to confirm the importance of adopting a sort of mistake tolerance [54] as the conditions that allow organizational members to take risks, promote innovative solutions, and improve knowledge without fear of repercussions for making mistakes. In particular, while several studies investigated the relationship between learning from mistakes and performance in ordinary organizational contexts, this study aimed to investigate the construct of organizational error and crisis management in the COVID-19 emergency. Thus, these results underline the possibility to extend the advantages of Error Management Training in emergency contexts as well as to promote innovative and flexible typologies of work following a horizon of development and sustainability.

Moreover, different studies have already identified a positive relationship between learning climate and job performance in a public administration context [55], and this study confirmed that a good climate in terms of learning by errors can nurture this kind of relationship.

There are, of course, some limitations of the study. Concerning the sample, this was a small sample of managers that do not allow generalizing of the data; on the other hand, it represents an interesting explorative study that could be seen as a starting point to future research on a larger sample.

Moreover, the qualitative research method adopted in this study was justified by the researcher's interest to use a deductive point of view, starting from the exploration of reality and ending with the implementation of practical interventions. Therefore, this study underlines the management interpretation of error management and learning climate, but it lacks an exploration of different points of view, firstly of employees. Therefore, further studies are also needed to explore this.

7. Conclusions

We started by reviewing the recent literature on error management and organizational change, and especially on the learning climate, characterized by the three different dimensions of facilitation and appreciation learning and error avoidance.

We moved to plan exploratory research to investigate organizational error management in the emergency context due to the COVID-19 pandemic. The key idea was to underline the extent to which it is possible to look at crisis as an opportunity for learning and self-evaluation, as well as a possibility to innovation and organizational progress. According to Giorgi and colleagues [56], organizations should foster positive practice in crisis periods, and positive management could relieve the employees' crisis perception, and in turn positively affect their health. This is also possible through the implementation of SDGs that provide actionable options for daily tasks that align the organization with goals of sustainable development [24]. In particular, according to social goals of education, the challenging dilemma between an error avoidance approach or error learning management seem to lean toward the latter. An organization can be said to be virtuous if it configures itself as a place in which everyone contributes to the diffusion of best practices.

To sum up, our preliminary results seem to confirm what emerged from the most recent literature, that there is an urgency for organizations to create a culture of intelligent risk-taking that leads to learning and improved knowledge. Organizational knowledge is distinct from the knowledge individual members possess, and rather encompasses codified, procedural knowledge such as organizational goals or routines.

Managers need to focus on comprehensive management, including social, economic, and ecological performance, through the implementation of sustainable long-term solutions. We believe that managers have the power (perhaps the imperative) to create a learning climate characterized by mistake tolerance by allowing employees to follow innovative activities, openly discuss errors when they occur, and refrain from punishing employees when mistakes are made.

We started to explore the point of view of organizations, represented by the managers interviewed; however, we believe that it is appropriate adopt a holistic vision that can question the two realities involved when we speak about safety at work: organizations and workers [57]. The former are committed to promoting a culture of safety and spreading an organizational climate in which security becomes a shared value; the latter, instead, are improperly seen in the literature and organizational contexts as passive actors without personal roles in safety management. In a perspective of sustainability, this study suggests that the development of social goals should be understood as a process in which all components interact with each other. Finally, we believe that these results open our future research work, expanding the investigation of error management and considering it as a strategic, but not exhaustive, dimension of Safety Management.

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